

REMARKS

This Application has been carefully reviewed in light of the Office Action mailed November 15, 2006. Claims 1-48 were rejected in the Office Action. Applicants submit that all pending claims are patentably distinguishable over the cited references for the reasons given below. Applicants, therefore, respectfully request reconsideration and favorable action in this case.

Claim Objections

The Examiner rejects Claims 5, 8, 22, 31, 42, 43, 44, 46 and 47 because of certain informalities. Applicants have either amended these claims to address the Examiner's objection or have canceled the claims. Therefore, reconsideration and favorable action are requested.

Section 112 Rejections

The Examiner rejects Claims 6, 23 and 33 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of which applicant regards as the invention. Claims 6, 23 and 33 have been canceled.

Section 103 Rejections

The Office Action rejects Claims 1-12, 14, 15, 17, 20-39 and 47 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,877,879 issued to Naito ("*Naito*") in view of U.S. Patent No. 5,717,510 issued to Ishikawa ("*Ishikawa*").

Independent Claim 1 of the present application, as amended, recites the following limitations:

A method for transmitting information in an optical communication system, comprising:

transmitting an optical information signal at a wavelength over an optical link with a first and a second end;

pre-distorting for dispersion the optical information signal proximate the first end of the optical link *to introduce an initial dispersion in the optical signal in the amount of at least 1000 picoseconds per nanometer (ps/nm), wherein this initial dispersion causes a widening of optical pulses of the optical signal;*

amplifying the optical signal in-line on the optical link between a transmitter and a receiver without the use of any in-line dispersion compensating modules; and

compensating the optical information signal proximate the second end of the optical link for dispersion, wherein the pre-distortion and the compensation have opposite polarity at the transmitting wavelength and wherein the compensation is in the amount of at least 10,000 ps/nm.

(amended portions being italicized). Independent Claims 20, 25 and 48 recite similar, although not identical, limitations.

Neither *Naito* nor *Ishikawa* disclose each and every one of these limitations. As recited in amended Claim 1, an optical signal is pre-distorted by a relatively large amount (at least 1000 ps/nm) and this initial dispersion causes a widening of optical pulses of the optical signal. Furthermore, the pre-distorted signal is allowed to travel along an amplified optical link without the use of any in-line dispersion compensating modules to allow the optical signal to accumulate even larger amount of chromatic dispersion along each span. Therefore, dispersion compensation in the amount of at least 10,000 ps/nm is required due to the accumulated dispersion in the optical signal. Neither of the cited references discloses transmitting a signal with such high pre-distortion and accumulated dispersion.

Naito discloses that a plurality of dispersion pre-compensating devices (one for each channel of a WDM signal) are introduced at the transmitter. Each of the dispersion pre-compensating devices compensates for the chromatic dispersion difference in a transmission line due to a wavelength difference between a wavelength of each optical signal and a specific wavelength of the signal at which a chromatic dispersion in the transmission line becomes zero. Thus, each per channel dispersion compensating fiber has a different length (to introduce a different amount of the dispersion) and a different sign (positive or negative) of chromatic dispersion coefficient. This method ensures that dispersion compensation at the receiver side is compensated completely for all of the channels. However, the introduced "pre-compensation" is not a large amount (only enough to account for the difference in dispersion between the particular wavelength being pre-compensated and the zero dispersion wavelength) and is not intended to significantly widen optical pulses. Furthermore, *Naito* does not disclose allowing accumulated dispersion in the optical signal to reach at least

10,000 ps/nm.

Ishikawa discloses techniques for transmitting signals in or near the zero-dispersion area of a fiber. It is well known that transmission in zero-dispersion area is highly susceptible to four-wave mixing effect (FWM). In particular, if the wavelength of a signal is set near the zero-dispersion wavelength and in a positive dispersion region, then FWM between signal and ASE noise occurs. To avoid this, *Ishikawa* discloses that one can chose a signal wavelength within the negative dispersion region with respect to a transmission line (to suppress FWM) and set the dispersion amount of a variable dispersion compensator at the transmitter to a positive value. However, the introduced "pre-compensation" is not a large amount (only enough to account for the difference in dispersion between the particular wavelength being pre-compensated and the zero dispersion wavelength). Furthermore, *Ishikawa* does not disclose allowing accumulated dispersion in the optical signal to reach at least 10,000 ps/nm. The point of *Ishikawa* is transmit near the zero-dispersion area of a fiber.

For at least these reasons, Applicants respectfully submit that Claim 1 of the present application is in condition for allowance. Furthermore, independent Claims 20, 25 and 48 recite similar, although not identical, limitations as Claim 1 and thus are allowable for analogous reasons. Therefore, Applicants respectfully reconsideration and allowance of Claims 1, 20, 25 and 48, as well as the claims that depend from these independent claims.

In addition, the Office Action rejects Claims 13, 16, 40, 42, 43 and 44 under 35 U.S.C. § 103(a) as being unpatentable over *Naito* in view of *Ishikawa* and further in view of Rybon ("160Gb/s TDM Transmission Over Record Length of 400 km Fiber Using Distributed Raman Amplification Only," ("Rybon")). Furthermore, the Office Action rejects Claims 19 and 46 under 35 U.S.C. § 103(a) as being unpatentable over *Naito* in view of *Ishikawa* and further in view of U.S. Patent No. 6,731,877 issued to Cao ("Cao"). Further, the Office Action rejects Claims 18, 41 and 45 under 35 U.S.C. § 103(a) as being unpatentable over *Naito* in view of *Ishikawa* and further in view of U.S. Patent No. 6,263,139

issued to Kawakami ("*Kawakami*"). Finally, the Office Action rejects Claim 48 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,559,920 issued to Chraplyvy ("*Chraplyvy*") in view of *Naito* and further in view of *Kawakami*.

Claims 13, 16, 18, 19, and 40-46 each depend from one of the independent claims discussed above (and independent Claim 48 was also discussed above). At least because these claims depend from one of these independent claims discussed above, Applicants respectfully submit that they are condition for allowance for the same discussed above. Reconsideration and favorable action are thus respectfully requested.

CONCLUSION


Applicants have made an earnest attempt to place this case in condition for allowance. For at least the foregoing reasons, Applicants respectfully request full allowance of all the pending claims.

If the present application is not allowed and/or if one or more of the rejections is maintained, Applicants hereby request a telephone conference with the Examiner and further request that the Examiner contact the undersigned attorney to schedule the telephone conference.

Although Applicants believe no fees are due, the Commissioner is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 02-0384 of Baker Botts L.L.P.

Respectfully submitted,

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